Understanding the role of learning and teaching support materials in enabling learning for all

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Abstract:

There are many assumptions about the ways in which textbooks, and other learning and teaching support materials (LTSM), can contribute to improved learning outcomes in a variety of international contexts. These can focus on ways that they can implement the school curriculum, often in lieu of good pedagogical practice. In the case studies from Rwanda and South Africa presented here, the complexity of the role of LTSM as part of classroom enactment is shown. Drawing key findings from across these case studies, the discussion suggests that there are enabling factors to this which focus on support for teachers' use of LTSM and availability of materials to all learners. A framework is presented in which LTSM, teachers and learners become equal partners in teaching and learning, but only when adequate language and other pedagogical support structures are provided. Conclusions consider the potential impact of LTSM use when it is elevated to a medium that is accessible and useful to both teachers and learners and where teachers are trained and supported to provide LTSM as a 'teaching partner' that needs to be accessible to learners.

Keywords: learning; pedagogy; textbooks; Africa; English Medium Instruction

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1. Introduction

There is significant current interest in the role of textbooks, and other learning and teaching support materials (LTSM), in effective learning systems. New policy papers from both UNESCO (2016) and the World Bank (Fredriksen and Brar, 2015) emphasise the potential that textbooks can have as cost-effective inputs for improving learning outcomes. However, the evidence for the ways in which textbooks can contribute to such improved outcomes is mixed (Glewwe, Kremer and Moulin, 2009; Spaull, 2012; Kuechen and Valfort, 2013; Read and Bantoux, 2016). Significantly, there is little evidence that LTSM use has an effect for the most disadvantaged learners with Glewwe et al. (2009) and Kuechen et al. (2013) both finding that textbook use only shows positive impact on learners with higher socio-economic status. Furthermore, Glewwe et al.'s study (2009) found that textbook sharing only saw significant improvement for learners who were already high achievers prior to the systematic provision of textbooks. This literature has also highlighted that there is a tendency for textbook availability to be used as a proxy for textbook use meaning that there is often limited attention paid to the ways that LTSM are actually used in the classroom by both teachers and learners.

It was in light of these concerns that the authors of this article came together as part of the BAICE Seedcorn Funded project *'the use of textbooks to support learning outcomes in Africa'* to consider the ways in which LTSM can enable effective teaching and learning in a range of classroom contexts. It is our contention that such research is particularly important for disadvantaged learners such as those who do not have access to reading materials or opportunities to speak in the Medium of Instruction (MoI) at home. This article first reviews key theoretical and empirical literature about the role of LTSMs in teaching and learning before outlining the two national contexts and rationalising their selection for comparative analysis. Drawing on key findings from four studies with which the authors have been involved, we explore the enablers and barriers to LTSM use in Rwanda and South Africa. The discussion and conclusions put forward a framework for LTSM use that focuses on the ways that materials are used by both teachers and learners with the potential to enable positive learning environments and improved learning outcomes.

2. Literature review

While textbooks, and other LTSM, are often referred to as homogeneous inputs into the schooling system in the policy literature, there is significant evidence to suggest that they are used in very different ways dependent upon classroom realities and wider policy demands. Remillard (2005) in an extensive review of studies on the way teachers work with LTSM draws the important distinction between the enactment and the implementation of materials. Enactment of LTSM is associated with teacher autonomy and professionalism while implementation is linked to the creation of 'teacher-proof' systems. Enactment can be understood as a dynamic relationship between the classroom triad of learner-teacher-materials. However, enactment presupposes that teachers have strong interpretive skills and that they engage with LTSM through a reasoned process that interrogates LTSM for the most effective pedagogical strategies for knowledge transmission. This necessitates teachers that have the confidence and competence to use the LTSM with all learners.

The idea of enactment can be seen to rest on socio-cultural theories of learning in which learning is seen as a culturally situated activity mediated mainly by language as the transmission tool (Vygotsky, 1978; Cole and Engeström, 1993). From a Vygotskian perspective, mediation is the learning process which enables the relationship between teacher and learner leading to more advanced cognitive development. Essential to this process are a range of semiotic tools or artefacts. LTSM can be examples of cultural artefacts that are part of the material world, imbued with cultural meaning and that are made and used by humans to accomplish goal-directed activity. As cultural artefacts, they have the potential to enable or extend human activity and constrain it depending in part on the role of the teacher in being able to mediate the access of the learner to LTSM (Remillard, 2005). Implementation, on the other hand, sees the LTSM as a content delivery tool and aims to design 'teacher-proof' or 'remote-control' material. This is often within a wider policy context which emphasises raising student achievement levels in standardised testing. Implementation assumes a model of teaching as the communication of pre-packaged knowledge and rests on behaviourist assumptions about learning (Remillard, 2005).

It can therefore be seen that there are different approaches and pedagogical assumptions made about the ways that LTSM could or should be used in the classroom. However, a further body of literature has highlighted the gap between policy intentions

and the ways that LTSM are actually used by teachers in the classroom. Sosniak & Stodolsky (1993) cites the patterns of textbook use described by Schmidt, Porter, Floden, Freeman & Schwille (1987) including conscious attempts at fidelity and selective use influenced by the students that are being taught and in support of curriculum objectives. Whether or not a specific teacher has a pedagogical preference to the use of LTSM in a particular way or where their use is prescriptive, there are invariably times when determinants like student population or pressure to conform to curriculum objectives will lead to some deviation – in other words where the school and classroom context shapes textbook use (Stodolsky, 1988; Valencia, et al., 2006; Crawford, 2004; Kauffman, 2002; Remillard, 1999).

The notion that the textbook can substitute for a lack of teacher knowledge and skills, suggests that teacher enactment is considered either immaterial or of relatively minimal importance (Crossley & Murby, 1994). Studies that look at standardised test results before and after the provision of textbooks have had mixed results. The most convincing conclusions have been that unless learners are able to engage with textbooks independently (i.e. they had the language facility and were already embedded in the subject issues) textbooks are of limited benefit. An evaluation done by Fleisch et al. (2011) of an intervention using custom-designed workbooks versus a conventional textbook in grade 6 classrooms in mathematics showed marked improvement in post-test scores of all participant learners, suggesting the possibility that the training of teachers on LTSM use that accompanied the evaluation was more influential than the materials themselves.

Much of the key literature related to effective teaching and learning materials comes from the field of second language acquisition. It is widely argued in the field of English as a Second language (ESL) that materials specifically designed to support the development of ESL contribute to effective learning (Gandara, Maxwel-Jolie & Driscoll, 2005; Brown, 2007; Hugo & Nieman, 2010; Kasule, 2011). These authors argue that the use of materials written for the ESL markets is important for language development. However, this is only if they are used in classrooms by teachers that are specifically trained to teach ESL and who are proficient in English. In African contexts, where English (or another European language) is usually taught in primary schools before it shifts to the MoI, there is a real need to understand (1) the impact that language has on LTSM use; and (2) how LTSM can effectively support language development.

Research into language and mathematics and science teaching in multilingual contexts has shown the value of learners using their home language in conjunction with other language(s) when they learn the subject (Makalela, 2015; Barrett and Bainton, 2016). Earlier studies report on the benefits seen from the use of pedagogically considered code-switching (Setati & Adler, 2000, Adler, 2001, Barwell, Barton & Setati, 2007). More recently researchers have shown that planned translanguaging can lead not only to improved understanding but also cognitive development (Garcia &Wei, 2014; Makalela, 2015). Both of these strategies allow and enable learners to express their ideas using more than one language. There are clear implications here for the ways that LTSM can contribute to more effective mediation between teachers and all learners to enable more positive learning outcomes.

The review of the literature has suggested that the evidence used regarding LTSM often assumes that LTSM is used in the same way in different classroom contexts. Rather, it can be argued that how LTSM are used is dependent upon a range of factors: the competence and confidence of the teacher; the pedagogical approach of the teacher; whether teachers have been trained in the use of the LTSM; and the classroom environment.

3. Methodology and research contexts

3.1 Methodology

The authors have all worked on research projects related to LTSM in Rwanda and South Africa and came together in a series of workshops and meetings with the starting point being the premise, already highlighted in the literature review, that LTSM use cannot be assumed and that more knowledge is needed about effective ways that LTSM can be used to enable learning for all. An abductive approach was taken. In this way, a 'process of interpreting and recontextualizing individual phenomena within a conceptual framework or a set of ideas' (Danermark et.al., 2002:80) was applied to answer two new research questions:

- What are the barriers and enablers to effective use of LTSM?
- How appropriate is an enactment model for the analysis of effective LTSM use?

The choice of the four studies was based on the common theme of how LTSM can be, and are, used by teachers in low income contexts. From Rwanda, the two mixed methods studies provide nationwide evidence of the ways that textbooks are used and the potential

for language supportive materials in improving learning outcomes. From South Africa, the first is a fine-grained analysis of the use of LTSM in four different categories of schools and the second one presents initial implementation findings from an ambitious project which aims to improve learning outcomes through the use of LTSM. Further details about the methodologies of all studies are given in tables 1 and 2. By drawing on these four disparate, and yet related, case studies, there is a significant evidence base through which to explore the two research questions.

[Tables 1 and 2 to be inserted here].

3.2 Research contexts

The two national contexts, and the studies presented here, provide a useful point of comparison since they challenge the fact that LTSM policy and practice can be assumed. In this section, these national contexts are outlined before an overview of the four studies involved and the analysis conducted for this paper. Rwanda's educational system has witnessed rapid expansion in the past ten years with the introduction of the nine-year basic education policy in 2007 and an extension to twelve years in 2010. The 2013-2018 Education Sector Strategic Plan places improved educational quality and associated learning outcomes as one of its key objectives. Textbooks, and other LTSM, have clearly been identified as important components for enabling this aim, particularly in relation to goals for improved literacy and numeracy skills:

> The adequate supply of appropriate teaching and learning materials, including textbooks and reading materials, has a significant bearing on quality, as does the capacity of teachers and educators to manage and use those resources in the schools and in the classrooms (Ministry of Education, 2013).

It is important to note that although the capacity of teachers to use materials is mentioned, training in textbook use is not part of the pre-service teacher training curriculum. A report by Transparency International (2012) showed that only a small number of teachers report having received training or support in the use of these materials in their classrooms through either pre-service or in-service training. At the time of the research conducted in this article, textbook procurement and distribution is implemented via an ambitious decentralised policy where individual schools are responsible for choosing the quantity and type of textbooks and reading materials required (Ministry of Education, 2013). Recent data has pointed to the successful distribution of textbooks in schools across the country with the citing of improved learner/textbooks ratios and greater textbooks

availability in the vast majority of Rwandan schools ((Ministry of Education, 2014; Transparency International, 2012).

While textbooks are broadly based on the curriculum content and objectives, there are identifiable differences in terms of their accessibility and perceived quality. For example, readability analysis of primary 4 textbooks found that there were some books that were significantly easier for learners to read than others (Clegg, 2013). This policy of promoting the use of different textbooks within the same school context reflects an approach to textbook use where schools and teachers are assumed to be able to make informed choices about which books will serve their learners best.

A rapid expansion of the educational system has also been witnessed in South Africa since 1994. The latest General Household Survey Report (Statistics South Africa, 2015) indicates that at peak ages of 7-15 years, attendance at school is almost universal. This statistic is uplifting but the quality of school education still leaves much to be desired – learners' performance on national and international systemic tests are poor (see for example, ANA (DBE, 2014), PIRLS (Howie, Venter, Van Staden, Zimmerman, Long, Du Toit, Scherman, Archer, 2008), TIMSS (HSRC, 2016). The Department of Basic Education (DBE) instituted its *Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011-2025* in an attempt to stabilise systemic change. One of the core objectives stated in this document is that "teachers will be helped to take responsibility for their own professional development" through (inter alia) "understanding the curriculum and learning support materials, preparing lessons and delivering them competently (2011:3). Implicit here is recognition of the role of LTSM in classrooms, but also the importance of sound delivery of LTSM.

There is a strong directive for teachers to use textbooks with schools provided with an annual budget and procurement list, similar to Rwanda. However, there is also an equally strong effort to provide learners with some learning materials in the form of government-produced workbooks. It is explicitly stated in policy documents that these workbooks are intended to complement other materials and comes with a vision of at least one printed text or workbook per child in maths and language from Grade 1-9. The question of textbooks in South African classrooms has a chequered history and these directives come in the wake of previous policy that actively discouraged the use of textbooks (in favour of teacher-produced materials that would cater for the specific needs of their learner

constituency) and even in current policy documents references to 'textbooks' are carefully avoided in favour of 'learning materials'. An active resistance to the use of textbooks in favour of teacher-produced notes and worksheets is part of a culture that has taken root in many South African primary schools (NEEDU, 2013).

The South African education system has been labelled a bimodal system (Venkat & Spaull, 2015) because two systems operate simultaneously: one which delivers education generally on a par with many high income countries and a second one (into which the majority of schools fall) that resembles schools in low income countries with all the concomitant problems such as large classes, constituencies from low socio-economic situation (SES), and MoI that is not the home language of the learners. In both countries, learners move from home language instruction to English in grade (year) 4. In this way, a large majority of schools in South Africa face similar challenges to Rwanda in enabling positive learning environments and achieving good learning outcomes for all learners. It is also clear that both national policies currently promote the importance of LTSMs in content delivery and have made them available in the majority of schools nationwide. The two contexts thus offer interesting case studies to explore the extent to which LTSM availability translates into use and in what ways LTSM contribute to improved learning experiences and outcomes.

However, there are also some clear differences in the national contexts regarding LTSM use. While LTSM focus on textbooks in Rwanda, workbooks are gaining prominence in policy decisions in South Africa. There is also a significant historical dimension that has been documented in South Africa with attitudes towards textbooks in particular influenced by previous policies and expectations. The focus on textbooks in Rwanda, by comparison, is relatively recent. These differences in policy and practice provide an opportunity to consider the broader explanatory potential of the framework outlined below through comparing its applicability across two contrasting country contexts. The presentation of findings in the next sections follows the same pattern as that used in the workshops. Each study's key findings are first given. Then the focus turns to drawing out key messages from across the evidence base, in a comparative analysis where appropriate.

4. The case studies

4.1 Rwanda

The first key finding from study 1 *(barriers to textbook use)* was that, while there were some differences in the quantity of books available, the capitation grants and distribution of textbooks had resulted in more books arriving in school store cupboards. However, the findings also demonstrate that textbook availability was not a precursor to textbook use in classrooms. Across the 1,370 classrooms observed, it was found that textbooks were present in more than half (58.5%) of all lessons (see Milligan, Tikly, Williams, Vianney & Uworwabayeho, 2017).

The follow-up classroom observations showed that in more than half of classrooms where books are present, the teacher is the only one with access to a textbook (56.78%). In less than one in ten classrooms (9.75%), were learners observed with textbooks in front of them and teachers systematically drawing on the materials in their teaching. This suggests that there is significant variation in the both the presence and use of textbooks in classrooms. Furthermore, in a policy context where textbook use is not prescribed, it is evident that textbooks are not used methodically nor do learners have regular access to their use inside or outside the classroom.

It was also clear that there is no systematic approach to training in the use of textbooks with over two thirds (71.9%) of teachers reporting to not having received any pre-service or in-service training about methodologies for integrating textbooks into their teaching. The impact that this has on teacher approach to the use of textbooks in the classroom can be seen in the perceived barriers to their more regular use given in teacher interviews. Teachers cited that they did not think that there were enough books for all learners and they did not know appropriate strategies for using books with learners when there is a high learner-book ratio. Teachers also raised concerns about the relationship between textbook and current curriculum content and the difficulty of the English used in the books for the linguistic levels of all their learners, particularly in the upper Primary cycle. These are all barriers that may result in limited use of textbooks by teachers and learners in the classroom, particularly when uptake is dependent upon the individual teacher seeing the benefits to their use. Study 2 (language supportive textbooks and pedagogy) found a significant relationship between the use of language supportive textbooks, pedagogy and learning outcomes (Milligan, Clegg and Tikly, 2016). Before the intervention, the difference between control and intervention school learner outcomes

was small (2.16%); however, in the post-test, learners at the intervention schools (N=550) was 16.09% higher than at the control schools (N=525). A key finding from this study is that more positive test scores were witnessed across the learner groups, including those that were shown to have very low English proficiency in the pre-tests. Classroom observation data showed that all learners regularly engaged in speaking, writing and reading activities, supported by both their access to their own textbook and the promotion of more activities in each lesson. Some teachers and head teachers also reflected on the higher levels of engagement among the learner body:

> They are really motivated to read these books…Since they easily interact with the books all the time they are free, the teachers get surprised to find that children have some knowledge on the new topics and this makes them active in the lesson. (Primary Head teacher)

Here, the head teacher also highlights the importance of learner independent work; something that was also revealed in the learner focus groups. For learners across the eight schools, it was evident that being able to take the textbooks home and study independently was an important part of the learning experience.

For learners and teachers, the other key aspect of the intervention was the sanctioning of the limited use of Kinyarwanda in the classroom. Many teachers demonstrated increased confidence in classroom observations when limited strategic code-switching was sanctioned. Similarly, learners in focus groups showed higher levels of engagement in the materials because of the glossaries and the promotion of some discussion activities in Kinyarwanda. One learner noted that the books 'encourage discovery because of group discussion' (Learner 1) and another that 'the books help us to read English, sometimes we take them home and try read and understand because we get the meaning of difficult words from the Kinyarwanda in the boxes (Learner 2).

Pedagogical practice witnessed in classroom observations was very different by the end of the intervention compared to that observed during the baseline study. At that time, nearly three quarters (74.70%) of lessons were characterised as teacher-led with little learner interaction, discussion or use of learning materials. By contrast, during the intervention, less than one third (31.94%) of lessons were entirely teacher-led. In every lesson, learners engaged in at least one activity and in many, learners completed written, talking and reading activities in groups with the teacher supporting this style of learning.

Interviews with teachers involved in the intervention highlighted that there were some challenges in implementation, including classroom and time management, and that the training and association mentoring was important for them in overcoming these initial barriers. A number of teachers also commented on their improved confidence through the lesson observations and the feedback received from observers:

> The only difficulty was to balance the use of Kinyarwanda and English but I finally managed to balance it properly. Initially, I also had difficulty in balancing the time for various activities, but with the exercise and advice from your feedback I got experienced and managed it well (Maths Primary 4 teacher).

This is a significant point as it suggests that the use of language supportive textbooks in classrooms is dependent on teachers feeling confident in the different pedagogical practices, such as the increased time spent on activities and the use of Kinyarwanda. Further research is needed to understand the impact that different aspects of the intervention may have independently; for example, the implementation of the textbooks without the associated pedagogical training and mentoring. However, it is evident that in this intervention, teachers felt enabled to enact and a positive relationship developed between the teacher-learner-materials triad in that learners could become an active, as well as independent part of the learning process through access to supportive textbooks.

4.2 South Africa

In study 3's analysis across the bimodal divide, two areas corresponded across both well-performing and poor-performing schools in the various sets of data: very little evidence of textbook-use; and the extensive use worksheets (Koornof, 2016). However, there were two areas in which there were marked differences - the lack of reading and writing and the lack of learner participation in lessons in poor-performing schools.

Almost all teachers choose to use visual aids in the place of textbooks. In the follow-up interviews, resistance to textbook use was widely cited. From a pedagogical perspective, teachers appear to have absorbed the message from the first post-apartheid curriculum, that professional teachers create their own materials: '*We were told not to rely on textbooks – we needed to use a variety of resources. It was part of OBE* [Outcomes-Based Education]*'* (Teacher from a township school). Historically, many South African teachers grew up under a system where textbook use was either very limited ('*I remember copying from the board endlessly – only the teacher had a textbook …You learnt through listening'*

(teacher in a township school), or so ideologically biased and uninteresting that teachers did not form a positive relationship with them ('*Matric, I remember, the History book which was from Boyce, […] we had to memorise and it was completely biased'* teacher in an suburban school).

Consolidation of classroom work observed was done through worksheets provided by teachers. These were often photocopied from existing textbooks, or in some cases, drawn from websites. Sometimes materials from various sources were cut and pasted to form a 'new' worksheet. Most of the materials chosen by the teachers were designed for minimal input: one word answers, short phrases, matching columns or labelling. Part of the reason for using such worksheets was that they satisfied department heads who checked teacher coverage of the curriculum, minimised marking, resembled the kinds of questions used for national assessments, and gave the appearance of teacher-produced materials. However, the effects for learners were often a fragmented and decontextualized presentation of the curriculum with often incomplete worksheets (the basis of what they used to study for tests), and a way to sidestep in-depth engagement with the work covered, since answers could be quickly entered as these were read out by the teacher during marking sessions.

Learners in poor-performing schools tended to do a minimum of reading and writing while in well-performing schools reading and writing was usually emphasised and learner participation in lessons was high. Here, where learners might have gained access to the curriculum and some stake in their education through textbooks, learners who worked without textbooks could gain a measure of this through intensive interrogation and discussion of the topics presented. This meant a teaching practice which encouraged strong learner participation with the teacher and the provided materials. By contrast, teachers in poor-performing schools cited language barriers but also reading resistance and a very slow writing pace as reasons for doing minimal reading and writing:

> Learners don't enjoy their textbooks. The learners cannot read. They are not interested. They lose interest because they can't read. Mostly, they don't understand what they read…
> Now it is possible to talk for a whole period. Now writing is a much smaller part of the lesson…
> (Two different teachers from a township school)

In Study 4 (Jika iMfundo), teachers who taught grades 4-12 all received a tracker – linked to all of the relevant textbooks on the South African national catalogue (see Witten, Metcalfe, Hodgson and Makole, 2018). The tracker serves as an instrument that guides teachers in the use of all eight of the national accepted textbooks, while at the same time regulates the pace at which teachers work. The primary goal is to facilitate curriculum coverage that is guided by materials and methodology recommendations. The structure of the tracker is such that a single textbook is not generally encouraged and extracts from different textbooks are suggested for use. In this way, the intervention supports the use of textbooks without promoting any one text over another. 59% of HODs and 52% of teachers indicated that they thought that curriculum coverage had improved in their schools as a result of Jika iMfundo. In the words of a teacher from the Uthungulu district, 'Yes, as I'm teaching Mathematics for 10 years in Grade 4 to 7, it is my first time to cover the curriculum'. Teachers also noted that they were pleased that the tracker was aligned with the national curriculum as well as the textbooks and using it has enabled them to plan consistently and reflect on their own learning. The tracker is thus another LTSM which has supported teachers within their departments and in their daily work because it provides a clear and practical interpretation of curriculum policy; particularly alongside relevant support for their ongoing professional development. However, it does not put LTSM in the hands of learners.

LTSM support in Jika iMfundo is different in the Foundation Phase. For example, in grades 1-3 Mathematics teachers receive additional LTSM in the form of detailed daily lesson plans (for learner-centred lessons) with the necessary printable resources for teacher use (e.g. cut-outs for classwork activities, enrichment activity cards, mental maths challenge cards, assessments). They also receive learner workbooks (one per learner) which include the daily classwork activities and a set of homework activities aligned with the lesson teaching activities. The LTSM provision in this phase was designed to support teachers to use translanguaging strategies[1] but this adds to the complexity of the material, and the value of this design feature needs to be further investigated. The learner activities are presented using parallel English/IsiZulu text and a bilingual dictionary

[1] The terms code-switching and translanguaging are used to describe flexible language practices (Garcia & Baetens Beardsmore, 2009). Translanguaging is recognised as a planned, purposeful use of more than one language as opposed to code-switching which is reactive and unplanned (Lewis, Jones & Baker, 2012).

(English/IsiZulu) is also provided to assist with translations. Many teachers commented favourably about the language support offered but felt that they needed additional training to use the bilingual material more effectively. The intervention is mid-term in its implementation – interim data indicates that much higher curriculum coverage rates are being achieved and more enthusiastic, confident teaching is taking place. The findings show that the materials are being widely used (and promoting textbook use) in project schools but more qualitative data will give further insight into their use in school classrooms in the province. The bilingual nature of the materials has the potential to act as an important support for ESL teachers, and also for learners who have the necessary literacy skills. This is a first step in the direction of using materials, teachers and learners in a far more interactive relationship.

5. Discussion

5.1 Barriers and enablers

Across the Rwandan and South African case studies, the first clear finding is that textbooks are widely available in the schools sampled but different contextual barriers may limit their effective use. In both countries textbooks are available, at least to teachers, who are often reliant on them for their own preparation. This use of textbooks as a classroom tool does not appear to be widely practised, unless there is some form of intervention which encourages and guides such usage. In Rwanda, study 1 showed that textbooks have been supplied across school types but there is a barrier to their use created by a lack of familiarity with pedagogy of systematic textbook use and concerns over the accessibility and quality of materials. An additional barrier is that textbooks are withheld from learners, placing all content presentation in the domain of the teacher. This may predetermine an implementation model. In South Africa textbooks, where they are available, have often been dismissed by many teachers. The qualitative data from study 3 suggests that factors in the South African environment militate quite strongly against the reintroduction of textbooks, unless done as part of a carefully monitored and supported intervention strategy (as early findings related to study 4 suggest). As in the Rwandan study on textbook provision, South African primary school classrooms seem to be characterised by minimal textbook use, and the assortment of LTSM and attendant pedagogical strategies do not often produce coherent, uniform and systematic curriculum coverage. This reflects earlier policy reforms that promoted the value of materials created by teachers themselves, and that continued when new and contradictory reforms were

introduced. Teachers cite language barriers but also general reading resistance. In addition, study 3 shows that the pressures of curriculum coverage and the way in which teacher talk and visual materials can be used as classroom management tools steer teachers away from textbook use. Therefore, while textbooks may be widely available, in both contexts the enabling mechanisms promoting the provision of textbooks may be rendered useless by barriers which exist. In other words, textbooks as a further and independent agent in the teaching process, and one that may create a measure of linearity, overview and coherence, is missing, when learners do not have access to them.

Given these different policy prerogatives and the cited barriers, this evidence base clearly adds weight to the arguments made by previous authors that textbook use cannot be assumed (Glewwe et al., 2009; Spaull, 2012; Kuechen et al., 2013). The studies of 'business as usual' from both Rwanda and South Africa demonstrate that there is an assortment of LTSM and attendant pedagogical strategies which do not often produce coherent, uniform and systematic curriculum coverage. However, the findings from both national contexts also suggest that it is possible that LTSM use can lead to improved learner engagement, higher quality pedagogic practice and more positive learning outcomes. LTSM have the potential to contribute to a more positive learning environment when used thoughtfully and where LTSM have been created with language and contextual barriers in mind. A teacher-learner-materials nexus can lead to higher engagement rates (empirically evident) and perhaps better learner outcomes.

The enablers were highlighted in the case of the two interventions where similarities can be drawn based on their promotion of systematic and inclusive LTSM use. Findings from Rwanda show that the LTSM were widely used with teachers willing to share LTSM with learners and engage learners on the content and presentation of LTSM in their teaching. However, this is dependent upon teachers having the necessary support, through training and mentoring, to develop their confidence and competence in using the LTSM to enhance their own pedagogical practice rather than replace it. The Jika iMfundo case provides further evidence that teachers value support given to them that guide them to use the most effective and appropriate textbooks and that this support helps them to cover the curriculum more fully, particularly for Mathematics teachers.

In study 2 (Rwanda), another key finding was the importance of all learners having access to the LTSM, both in the classroom and for use at home. The qualitative findings suggested learners' access to high-quality and accessible textbooks heightened learner

engagement. These findings are noteworthy given that they demonstrate higher levels of engagement both in the classroom and at home. The interviews with head teachers, teachers and learners, hence, demonstrated widespread support for the use of the intervention textbooks by learners, teachers and head teachers. Similarly, in the case studies from South Africa, it is clear from observations that in teacher-led lessons where no materials are available to learners except worksheets, and front-of-class visuals, teachers can direct learner engagement through the kinds of question they ask, while not necessarily interacting with learner needs. Learners' lack of access to LTSM inhibits opportunities on their part for independent engagement with the curriculum which might lead to greater participation in learning.

It is also evident that the quality of the LTSM matters. It cannot be assumed that their availability will translate into use; nor can it be assumed that when teachers do not use them, it reflects poor pedagogical choices on the behalf of the teacher. In both national contexts, teachers raised legitimate concerns about the quality and accessibility of the LTSM available. In Rwanda, the linguistic demands of existing textbooks were a barrier to their regular use in the classroom; something that was also seen in related readability studies (Clegg, 2013). On the other hand, language supportive textbooks were very well-received as they made it easier for both teachers and learners to engage in the curriculum. In South Africa, the Jika iMfundo tracker development gave insight into the differences in quality between textbooks on the national list of textbooks. The tracker was initially developed to enable more effective use of existing LTSM – an unexpected but useful aspect of the tracker was that it exposed weaknesses in certain textbooks thus giving teachers easily accessible information that could guide their choices.

In summary, the following table outlines the barriers and enablers to effective LTSM-use as suggested by the case studies:

[insert table 3]

5.2 Towards a framework

While there have been clear findings related to teachers, learners and materials individually, we would posit that the evidence from both contexts supports the potential for an enactment framework for teaching and learning which uses teachers, learners and materials as an interactive triad that relies on the participation of all three elements to

achieve coherent and meaningful learning (see figure 1, developed from Remillard, 2005).

Each element of the triad is embedded in a series of contextual issues that relate to socio-economic, linguistic, cultural, historical, and individual factors. LTSM production is dependent on the ideological, pedagogical and economic constraints – all and any of which shape the content, presentation and activities that are contained in the LTSM. LTSM is a (usually) silent, but highly present agent which has (or can have) a marked impact on the reception of ideas and content. How these are experienced by the teacher, or the teacher, as well as the learners, shape the understanding and building of knowledge and ideas. A carefully constructed LTSM, that considers the language needs, the probably prior knowledge of learners, the most effective modes for presentation of content, and activities that lead to the contextualisation and internalisation of the curriculum, can augment and cement how the teacher mediates the LTSM in a lesson.

Learners are diverse in many ways, ranging not only in capacities (of various sorts, such as language, as well as intellectual, as well as disposition, amongst others), and access to information, ideas and experiences through which they receive the curriculum, but also interest levels and distractions that may have to do with health, family, and community matters. Cultural and religious factors often play a role. Engagement (or as often as not, non-engagement) in a lesson determine the construction of ideas and knowledge. Where teachers are given entry to learner thinking and seek to know learner understanding of content, plays a significant role in whether learning takes place (Cohen, 2011).

Teachers are usually seen as pivotal, and a great deal of current literature on LTSM discuss teacher mediation of LTSM as a singular phenomenon. Teachers work within systems, which come with agendas and demand particular practices and outcomes from teachers. In addition, teachers also have their own ideological, cultural, social, and pedagogical predilections.

In a classroom context, where LTSM, learners and teacher interact, it is inevitable, that LTSM implementation (defined as unadulterated delivery of LTSM) is not conceivable. The dynamics of the classroom itself (the size, the facilities, the age group, the composition, the time of day, and many other factors) make enactment of LTSM preferable. We argue that for such enactment to be fruitful, teacher consciousness regarding the role of LTSM, and the variety of mediation strategies that allow for solid learning and learner participation is vital.

While build on the Remillard's conceptualisation of enactment (2005), there are some ways that our findings take the framework in a new direction. We particularly highlight the importance of teachers who are trained and supported to be the enablers of effective pedagogy. Teacher enactment can be summarised as the creation of lesson coherence, the confidence to use the affordances that different modes of presentation provide, and the orchestration of the levels of interaction that take place between the different parts of the teacher-learner-LTSM triad. These qualities are dependent on thoughtful preparation, usually grounded in pre-service and in-service training on materials. Teachers require confidence and competence to enact such a pedagogical approach. Time needs to be spent on lesson preparation that does not see the textbook or LTSM as the lesson template, but an agent and additional tool in classroom interaction.

[Insert Figure 1]

Affordances are part of the materials used, but also the way in which teachers represent and demonstrate their knowledge and skills. Knowing when (and most importantly, why) certain modes are more appropriate and deliver content and ideas more clearly facilitates not only clarity, but, indeed, coherence. Finding ways to bind the lesson through skilful management of materials, own input and learner responses further embeds coherence, memorable presentation and clarity. Where learners have both the teacher's explanation and an independent and accessible source that discusses and presents the topics and ideas, greater possibility for learner understanding and knowledge development can be created. The framework thus promotes the importance of learners having full access to LTSM so that they can be active participants in the classroom. An accessible and language supportive textbook allows learners to ponder, reread, read ahead, link ideas to visuals, and to cross-reference. Such opportunities could lead to learner input in classroom interactions in the form of questions for clarification and comments that express interpretation. Here, the framework suggests that this can lead to heightened learner engagement and a more democratic pedagogy. This is significant since it suggests the potential for LTSM to support learning for all, something for which there is limited existing evidence (Glewwe et al., 2009; Kuechen et al., 2013).

The dynamics presented will interact in different ways in different classrooms but the findings from two national contexts with contrasting policies suggest that they will all be important to some extent and influenced by external factors that impact on any of the three elements at both the systemic level (e.g. curriculum) and institutional level (e.g.

school leadership). One clear external factor to emerge from this evidence base is the issue of language support as a crucial element for both teachers and learners, and one that may be integrated through LTSM. Choice and use of language enables LTSM use, as shown previously in ESL contexts (Kasule, 2011; Hugo & Nieman, 2010). Alongside more accessible materials, it was also clear that the sanctioning of some strategic code-switching and inclusion of activities in mother tongue facilitated teacher confidence and more participatory classroom practice (Milligan et al., 2016; Barrett et al., 2016). In the South African context there is not a clear finding in relation to language use in Jika iMfundo schools, as observations have yet to be carried out, but the choice of providing bilingual material, in support of translanguaging in mathematics lessons, was based on the literature (Setati and Duma, 2009; Makalela, 2015), and has been well received at the district level, with an awareness that training for appropriate use of the material will be needed. Language supportive classrooms can thus be seen as enabling environments for the implementation enactment framework for the teaching and learning not only of language but across the curriculum.

6. Conclusions

This paper has provided further evidence that textbook availability cannot be used as a proxy for textbook use (Glewwe et al., 2009; Spaull, 2012; Kuechen et al., 2013). However, it has also gone beyond previous studies by highlighting the enablers and barriers to effective textbooks and building upon an enactment framework that considers the processes by which textbooks and other LTSM can be supportive of teachers' pedagogical enactment and responsive to learners, particularly the language requirements they may have. In this framework, rather than seeing LTSM as a way to implement the curriculum in a prescriptive manner, they can be utilised as artefacts that mediate the relationship between teaching and learning (Vygotsky, 1978; Remillard, 2005). Without such a framework and the training and support that it can provide, teachers who do not have the competence and confidence to use LTSM in an enactment framework, may revert to a more behaviourist approach and/or not use textbooks at all. The importance of guidance and support for teachers, as shown by studies 2 and 4, cannot be underestimated.

It has been shown that there is significant evidence that although LTSM can be used by teachers to enable a more positive learning environment for all learners, for such a framework to be successful, there are a number of contextual conditions that need to be considered with implications across the education system. These include relevant pre-

service and in-service teacher training which recognises that teachers need ongoing support in using LTSM effectively; appropriate mechanisms to ensure that accessible LTSM are produced, procured and distributed to all schools; and a curriculum that is not overloaded, allowing for a less prescriptive pedagogical approach. A language supportive classroom has also been shown to be significant (Milligan et al., 2016; Barrett et al., 2016). One clear difference that emerged from the data is that socio-cultural values and policy prerogatives, past and present, related to textbook use differ by national and local context.

It is important to note that this was an exploratory process and the framework developed is suggestive. The findings suggest that while there is potential for an enactment framework when this is accompanied by significant teacher training and support, the overt encouragement of enactment, particularly in South Africa, has led to enactment taking a haphazard form. More research is needed to explore the complexity of the pedagogical and learning processes that underpin this enactment framework so as to fully understand how this differs from an implementation or behaviourist model and to provide a more robust evidence base for the ways that textbook use increases learner engagement and improves learning outcomes. This is particularly significant since the implementation of such a framework would be costly given the importance it places on all learners having access to LTSM, accountability measures and ongoing teacher training. However, we would argue that this expense might be justified given the evidence from the case studies that LTSM are currently under-used and therefore not a cost-effective input into the education system. Where teachers circumvent textbooks and other LTSM, or are unable to use this important element of the triad, a substantial opportunity for learning gets lost. Finding ways to create, introduce into classrooms, and train teachers on supportive LTSM that make this opportunity evident to them needs to be a policy priority and part of any research agenda that promotes learning for all.

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